

Every Drop Counts

*Rio Grande initiative
expands efficient irrigation,
water conservation*

Since its inception in 2001, the Rio Grande Basin Initiative (RGBI) has achieved significant water savings and accomplishments. A joint effort of Texas A&M Agriculture and New Mexico State University College of Agriculture and Home Economics, the initiative's nine research and education tasks address efficient irrigation and water conservation.

"The Rio Grande Basin Initiative has been very valuable because it has provided an opportunity to bring together all the things we know about water conservation into one package through research and development of new water practices," said B.L. Harris, RGBI project director and associate director of the Texas Water Resources Institute. "This research is coupled with an effective educational program to demonstrate and train people to implement the best and most appropriate practices to conserve water."

Roughly 160 Texas and New Mexico RGBI participants collaborating with local irrigation districts, agricultural producers, homeowners, 19 external agencies and other universities are dedicated to expanding efficient use of available water resources and creating new water supplies for the Rio Grande Basin.

Working in cooperation with irrigation districts, economists and engineers have developed evaluation tools to guide irrigation districts in water-use efficiency infrastructure and cost-of-saving-water analysis. The Rio Grande irrigation district economics tool (RGIDECON[®]), the rapid assessment tool (RAT) and geographic information systems (GIS) are three of the main tools developed during the RGBI's 5-year history.

To assist producers with irrigation scheduling, researchers have established on-farm monitoring of crop water use. They have taken extensive soil samples to determine nitrogen content with soil depth, rooting depth and other soil properties necessary for adapting the Crop Production and Management Model (CropMan) to the area. CropMan also allows producers to assess economic trade-offs of allocating limited water resources between various crops at varying crop growth stages.

Water is the primary factor limiting the production of many crops in the Lower Rio Grande Valley of Texas, and researchers have found using improved furrow irrigation techniques and scheduling for sugarcane production can save 10 percent to 15 percent of irrigation water or between 20,000 and 30,000 acre-feet.

RGBI researchers created the Precision Irrigators Network (PIN), which incorporates growers into the research process by demonstrating water saving,



efficient irrigation techniques and installing soil moisture monitoring sensors. Researchers estimate that on a “typical” 100-acre field, water savings using PIN can amount to 6 to 8 inches of water per acre per year, or 163,000 to 217,000 gallons per year. Based on 620,000 acres of irrigated land in the Rio Grande region alone, PIN can save 311,000 to 413,000 acre-feet of water per year.

The use of flexible, plastic polypipe and water-metering devices to replace inefficient and leaky ditches and siphon tubes has steadily increased in the Lower Rio Grande Valley and in nearby Mexico. Three demonstrations conducted in Tamaulipas, Mexico showed that irrigation could be reduced by 30 percent by using polypipe.

Extension specialists have conducted in-home water conservation demonstrations in 45 households to determine the amount of water a typical family of four uses. Extension specialists provided them with in-home water audits and educational materials as well as lists of recommended behaviors and fixture changes. In some cases, they installed water-conserving fixtures. Preliminary results show that educational interventions can reduce water use by 25 percent.

RGBI funding also focuses on coordinating basinwide activities related to the Pecos River, a major tributary of the Rio Grande. The project is documenting how much water can be saved by large-scale saltcedar management programs. To date, scientists have treated more than 13,000 acres of saltcedar within the basin with herbicides. Current research indicates that potential water salvaged from saltcedar is at least 2 feet per acre per year. Assuming this minimum amount of salvage, more than 26,000 acre-feet of water has been salvaged from these saltcedar control programs.

Because increased use of soil testing as a standard best management practice will improve overall production economics and provide added protection for critical and limited water resources, Extension specialists conducted a four-county soil-testing program. Projected fertilizer savings based on soil tests were an estimated 1.7 million pounds of nitrogen and 2.3

million pounds of phosphorus. These reductions in fertilizer application represent a reduced threat for nutrient contamination of surface and groundwater resources. The total economic impact from the project was estimated at \$1.0 million based on average per-pound costs for nitrogen and phosphorus.

Researchers in El Paso used genetic typing to determine that the levels of certain bacteria in river water are much higher during the non-irrigation season than in the irrigation season. Researchers will use these data to assess the human and animal health risks associated with using winter return flows and will help develop strategies that can safely extend municipal and agricultural water supplies.

Since Texas presently reclaims about 5 percent of its wastewater with the potential to reclaim greater quantities, further research is being focused on salty groundwater, graywater and concentrate as alternative water sources for irrigation in rural and urban areas. The research strategy is to remove salts prior to irrigation to levels acceptable for salt-tolerant crops. RGBI researchers have evaluated more than 70 different landscape plant species for salt-tolerance. In El Paso, the urban landscape area irrigated with moderately salty reclaimed water has increased from 150 acres to 325 acres during the past seven years.

“One of the keys to a project of this type is widespread and collective collaboration,” Harris said. “Water management districts, ag producers, municipal water users and others involved on both sides of the border working collaboratively is an absolute must.”

The RGBI is federally funded, administered by the Texas Water Resources Institute, in collaboration with New Mexico State University, and funded through the U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service.

For more detailed information regarding the RGBI and its progress and accomplishments, go to <http://riogrande.tamu.edu>.

